

PATENT SPECIFICATION

648,809



Date of Application and filing Complete Specification Dec. 13, 1949.

No. 31962/49.

Application made in Switzerland on Dec. 13, 1948.

Complete Specification Published Jan. 10, 1951.

Index at acceptance:—Class 20(iv), B2(f3: v5).

COMPLETE SPECIFICATION

Method of Producing Shuttering for the Concrete Skeletons of Buildings

I, GOTTFRIED SCHINDLER, Dipl. Arch., E.T.H., S.I.A., a Citizen of the Republic of Switzerland, of Talstrasse 62, Zurich, Switzerland, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention is concerned with a method of producing shuttering for the concrete skeleton of buildings.

Shuttering according to this invention is particularly useful for incorporation in prefabricated wall units utilized in the construction of concrete skeleton frame buildings, but the invention is not restricted to use in buildings in which prefabricated wall units are employed.

Where in the production of concrete skeletons of buildings the shuttering remains in position, or is used only once, as for example in buildings constructed by the method described in the Specification of Letters Patent No. 609,498 granted to the present Applicant, it is desirable to use for such shuttering materials which, if not the cheapest available, are at least inexpensive.

It is the object of this invention to provide an economical method of producing highly satisfactory shuttering for the aforesaid purpose by the use of inexpensive material.

In many countries it is possible to obtain cheaply and easily a thin board commonly known as "plasterboard", consisting of a main layer or ply of plaster between outer or covering layers or plies of cardboard, and in the method according to this invention of producing shuttering for the concrete skeletons of buildings, use is made of this material, the plasterboards employed each having cut in it from one side or surface fold channels which are of triangular shape in cross section and are spaced apart at distances appropriate to the widths of the respective faces of the portion of the

skeleton to which the shuttering unit being formed appertains, the channels extending from said side or surface to the cardboard layer or ply at the other side of the plasterboard, and there being applied to the plasterboard at the channelled side thereof, after said channels have been cut, a coating of adhesive water-repellent material, after which the plasterboard is folded into the requisite shuttering shape.

In order that the method of producing shuttering according to this invention may be fully understood, it will now be described with reference to the accompanying drawings, in which:—

Fig. 1 shows a plasterboard with fold channels formed therein and with a portion of its surface coated with water-repellent adhesive.

Fig. 2 is a cross-section to a larger scale than Fig. 1 of a portion of the plasterboard in the region of one of the channels before the adhesive coating is applied.

Figs. 3 and 4 show, somewhat diagrammatically, the plasterboard illustrated in Fig. 1 partially and fully folded into the shape requisite for the portion of the concrete skeleton for which it is intended.

Fig. 5 shows a portion of shuttering, such as that illustrated in Fig. 4, provided with a sheathing, hereinafter described, over a part of its length.

Fig. 6 is a fragmentary view showing in vertical cross section a portion of a building comprising shuttering produced according to this invention.

Fig. 7 illustrates in vertical section shuttering produced according to this invention for two vertical pillars and a horizontal beam, and

Fig. 8 illustrates in sectional plan a portion of a building incorporating the shuttering shown in Fig. 7.

Referring to the drawings, the rectangular plasterboard 1 shown in Fig. 1 is formed by a thin gypsum layer or ply

2, Fig. 2, which has on its opposite sides cardboard coverings or plies 3 and 4, respectively. On one side of the plasterboard 1 are provided four parallelly disposed fold channels 5 running in the longitudinal direction of the board, which channels sub-divide the surface of the plasterboard into five panels. The distance between the respective channels 5, and thus the width of the panels, depends on the width of the faces of the portion of the concrete skeleton to which the shuttering appertains. Since the aforesaid channels 5 form fold channels, they are of triangular shape in cross-section, and they extend in depth as far as the cardboard coating 4 at the other side of the plasterboard 1. (On the side of the plasterboard 1 which will face inwardly when folded there is applied an adhesive coating 6, preferably a thin layer of bitumen, which conveniently is sprayed on in a hot state.) The plasterboard prepared in the manner described is folded at the fold channels 5, as illustrated by Figs. 3 and 4, into the desired shuttering shape, in which the two outer panels of the said plasterboard overlap or lie one against the other.

Referring particularly to Fig. 5 the surface of the plasterboard 1 which is at the outside of the shuttering is provided with a water-repellent film or covering. It is shown as extending over part only of its surface. Conveniently it is provided by a thick sheet of protective paper 7 (see also Figs. 6 to 8), which entirely or partially surrounds the shuttering, but it may also be constituted by a coating of oil paint. (However, a coating of textile fabric or sisal fibres may also be provided on the shuttering.) As a further alternative the coating of the plasterboard may consist of paper containing sisal fibres; it may if desired have aluminium foil on the outside. It is also possible to cover the surface of the plasterboard comprised in the shuttering which is visible in the finished building, with a surface material which strengthens the shuttering and at the same time has a favourable aesthetic effect; a suitable surface material of this type is synthetic leather or the like. On its other side the plasterboard can be covered with sisal fibres and aluminium foil, whereby the plasterboard 1 is correspondingly strengthened. Coverings and reinforcements of the type mentioned are applied to the plasterboard before the latter is folded.

In Figs. 7 and 8, shutterings for two concrete pillars of rectangular cross-section are shown which are formed by means of two plasterboards 1, and in

Figs. 6 and 7 a shuttering is shown for a beam of rectangular cross-section which serves to join the pillars in question, said beam shuttering being formed from one plasterboard 1. In Figs. 7 and 8 concrete has already been poured into the shuttering provided for the left-hand pillar. Each pillar shuttering is positioned with its bottom edge in a frame 8 of angular cross-section and consisting for example of metal, said frame serving to protect the shuttering, particularly against water which might otherwise rise. At the points where the pillar shutterings and the beam shutterings join one another foils 9 are disposed on the inner side of the shuttering and cover the joins; these foils, which are secured by adhesion, and which may be paper, textile fabric, metal or like materials, serve as connecting means for the shutterings. In Figs. 6 and 7, 3^a denotes corner strips which are pressed into the adhesive which accumulates in the fold angles when the plasterboard is folded, and strengthen the shuttering. Connecting screws 10 (Fig. 8) are driven into the pillar shutterings, before concreting, and extend into the free space in the shuttering, so that they will subsequently be anchored in the concrete skeleton. Accordingly, parts connected to the pillar shutterings, for example the frame 11 of a window 12, and also wall sheets or plates 13 (Fig. 8), are secured by these screws to the concrete pillars. This method of construction is therefore particularly suitable in cases where elements serving as space closure means are used, which have to be joined to the concrete skeleton, or in cases where prefabricated walls are used on which shutterings for producing the concrete skeleton are provided. Instead of screws 10 other fastening means may of course be used. Thus, for example, 14, Fig. 8, denotes an anchoring iron which serves to connect the respective pillar shuttering to a brick wall 15.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. Method of producing shuttering for the concrete skeletons of buildings, wherein shuttering units are formed by folding plasterboards, each plasterboard having cut in it from one side or surface fold channels which are of triangular shape in cross section and are spaced apart at distances appropriate to the widths of the respective faces of the portion of the skeleton to which the shuttering unit being formed appertains, the channels extending from said side or surface to the

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cardboard layer or ply at the other side of the plasterboard and there being applied to the plasterboard at the channelled side thereof, after said channels have been cut, a coating of adhesive water-repellent material, after which the plasterboard is folded into the requisite shuttering shape.

2. Method of producing shuttering as claimed in Claim 1, wherein the side of the plasterboard in which the fold channels are cut is coated with bitumen, conveniently sprayed on in a hot state.

3. Method of producing shuttering as claimed in Claim 1, or in Claim 2, wherein reinforcing strips are pressed into the adhesive which accumulates in angles of a unit as a result of folding the plasterboard.

4. Method of producing shuttering as claimed in any of the preceding Claims, wherein to form a shuttering unit of rectangular cross-section the plasterboard is divided by four fold channels into five panels, the two outer panels lying one against the other when the plasterboard is folded into shuttering shape.

5. Method of producing shuttering as claimed in any of the preceding Claims, wherein that surface of the plasterboard which, when the latter has been folded, constitutes the outside surface of the shuttering unit has applied to it a water-repellent film, e.g. oil paint.

6. Method of producing shuttering as claimed in any of Claims 1 to 4, wherein that surface of the plasterboard which, when the latter has been folded, constitutes the outside surface of the shuttering unit has applied to it a protecting layer of thick paper.

7. Method of producing shuttering as claimed in Claim 6, wherein sisal fibres are incorporated in the paper applied to the outside surface of the shuttering unit.

8. Method of producing shuttering as claimed in Claim 7, wherein the paper containing sisal fibres is covered with an aluminium foil.

9. Method of producing shuttering as claimed in any of Claims 1 to 4, wherein that surface of the plasterboard which, when the latter has been folded, constitutes the outside surface of the shuttering unit is covered with textile fabric.

10. Method of producing shuttering as claimed in any of Claims 1 to 4, wherein that area of the surface of the plasterboard which is visible when the shuttering unit is in position is covered with a material, e.g. synthetic leather or the like, which reinforces the shuttering and has a favourable aesthetic effect.

11. Method of producing shuttering as claimed in any of Claims 1 to 4, or in Claim 10, wherein that area of the surface of the plasterboard which is not visible when the shuttering is in position, is covered with sisal fibres and aluminium foil.

12. Method of producing shuttering as claimed in Claim 10, or in Claim 11, wherein the respective coverings are applied to the plasterboard before it is folded.

13. Method of joining shuttering units produced as claimed in any of the preceding Claims and incorporated in prefabricated walls to constitute the shuttering for concrete pillars and a beam connecting the same, wherein the joints between the shuttering units are bridged by foils disposed in the space bounded by the shuttering and adhesively secured to the latter.

14. Method of protecting a shuttering unit produced as claimed in any of Claims 1 to 12 and constituting the shuttering for a pillar, wherein the said unit is positioned with its bottom edge in a frame, e.g. a metal frame of angular cross-section.

15. The herein described method of producing shuttering for the concrete skeletons of buildings

16. The herein described method of producing units incorporated in prefabricated walls and constituting shuttering for pillars and beams comprised in the concrete skeleton of a building.

17. Shuttering for the concrete skeletons of buildings, constructed substantially as described with reference to the accompanying drawings.

Dated this 13th day of December, 1949.

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47, Victoria Street, London, S.W.1,
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[This Drawing is a reproduction of the Original on a reduced scale.]

